

Remarks

Applicant respectfully requests that the Examiner reconsider the present application in light of the above amendments and following remarks. Claims 1, 5, 18, 24 and 25 have been amended and claims 15, 17 and 20-23 have been cancelled. Claim 26 has been added. Therefore, claims 1, 3-9, 11-14, 16, 18, 19 and 24-26 are pending in the present application.

Claims 1, 3-9, 11-19, 24 and 25 have been rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. See *Final Office Action*, pg. 2. In particular, the Examiner stated that the term "stabilized ferritic stainless steel" in claims 1, 5, 18, 24 and 25 is indefinite and inconsistent. Claims 1, 5, 18, 24 and 25 have been amended to specify ranges, in terms of weight percent, of chromium and titanium and/or columbium. Therefore, Applicant requests that the rejection of claims 1, 3-9, 11-19, 24 and 25 be withdrawn.

Claim 1 has been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,601,664 to Kosa et al. ("the Kosa reference"). However, in the explanation of the rejection, the Examiner made reference to U.S. Patent No. 6,409,102 to Luttrell et al. ("the Luttrell reference"). Since it is unclear as to which reference the Examiner is basing his rejection on, Applicant will respectfully traverse this rejection based on the Luttrell reference.

Amended claim 1 is directed to an electric solenoid comprising a plurality of components formed of solenoid-quality stabilized ferritic stainless steel. The

stabilized ferritic stainless steel comprises, in terms of weight percentage, about 21% to about 35% chromium and at least one element selected from the group consisting of titanium and columbium. Each of the at least one element is present at no more than about 1.5 weight percent.

Applicant submits that the Luttrell reference does not teach or suggest an electric solenoid formed of solenoid-quality stabilized ferritic stainless steel comprising, in terms of weight percentage, about 21% to about 35% chromium and at least one element selected from the group consisting of titanium and columbium, wherein each of the at least one element is present at no more than about 1.5 weight percent as recited in amended claim 1. The Luttrell reference generally states that a cover (24) and a cap member (26) are fabricated from 430 stainless steel, and that other materials such as ferritic steels may be employed. See *Luttrell*, Col. 6, lines 36-39, 43-44. However, nothing in the Luttrell reference specifies a specific weight percentage of chromium, titanium or columbium. As such, the Luttrell reference fails to teach all of the limitations present in amended claim 1.

For at least the foregoing reason, Applicant submits that the Luttrell reference fails to teach or suggest all of the limitations disclosed in claim 1 and requests that the rejection of claim 1 be withdrawn.

Claim 1 was also rejected under 35 U.S.C. § 102(b) as being anticipated by either the Kosa reference, U.S. Patent No. 4,705,581 to Honkura et al. ("the Honkura reference"), or U.S. Patent No. 5,091,024 to DeBold et al. ("the DeBold

reference"). Applicant respectfully traverses these rejections based on amended claim 1.

Applicant submits that the Kosa, Honkura, and DeBold references do not teach or suggest a stabilized ferritic stainless steel comprising about 21% to about 35% chromium as recited in amended claim 1. In rejecting claim 1, the Examiner stated that the Kosa, Honkura, and DeBold references each disclose a solenoid-quality stabilized ferritic stainless steel which can be used in solenoid valves. See *Final Office Action*, pg. 5. More particularly, the Kosa reference states that the disclosed alloy contains between about 15-20% of chromium, no more than about 0.02% titanium, and between about 0.10-1.0% niobium (also known as columbium). See *Kosa*, Col. 2, lines 38-51; Col. 3, lines 1-16; Col. 4, lines 17-18. However, nothing in the Kosa reference teaches or suggests a stabilized ferritic stainless steel comprising about 21% to about 35% chromium as recited in amended claim 1.

The alloy disclosed in the Honkura reference is described as including 10-13% chromium and between 0.05-0.20% titanium. See *Honkura*, Col. 4, lines 1-17. As with the Kosa reference, the Honkura reference does not teach or suggest a stabilized ferritic stainless steel comprising about 21% to about 35% chromium as recited in amended claim 1.

Further, the alloy disclosed in the DeBold reference is described as including between 2-13% chromium and no more than about 0.01% titanium. See *DeBold*, Col. 3, lines 17-30, 65-67; Col. 4, lines 1-14; Col. 5, lines 16-18. The DeBold reference does not teach or suggest a stabilized ferritic stainless

steel comprising about 21% to about 35% chromium as recited in amended claim

1.

For at least the foregoing reasons, Applicant submits that the Kosa, Honkura, and DeBold references fail to teach or suggest all of the limitations disclosed in claim 1 and requests that the rejection of claim 1 be withdrawn.

Claims 1, 3-9, 11-13, 15-19, 24 and 25 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Luttrell reference in view of the Kosa reference. Since claims 15 and 17 have been cancelled, the rejection of these claims is moot. In view of the above amendment, Applicants respectfully traverses the rejection of the remaining claims.

In rejecting claim 1, the Examiner stated that the Luttrell reference discloses a cover (24), a cap member (26) and an inner housing (14), which may be formed of solenoid-quality ferritic stainless steel. *See Final Office Action*, pg.

6. However, the Examiner acknowledged that the Luttrell reference does not disclose a "stabilized" solenoid-quality ferritic stainless steel. *See id.* In order to teach a "stabilized" solenoid-quality ferritic stainless steel that may be used in a solenoid and fuel injection component, the Examiner combined the teachings of the Kosa reference with the Luttrell reference.

Applicant submits that the combination of the Kosa reference with the Luttrell reference does not teach or suggest an electric solenoid including a plurality of components formed of solenoid-quality stabilized ferritic stainless steel comprising, in terms of weight percentage, about 21% to about 35% chromium as recited in amended claim 1. While the Kosa reference may

disclose an alloy including, in weight percentage, between 15-20% chromium, the Kosa reference teaches away from using more than 20% chromium. See Kosa, Col. 2, lines 45-51. Since the Kosa and Luttrell references fail to teach or suggest all of the limitations included in amended claim 1, Applicant requests that the rejection of claim 1 be withdrawn. As claims 3 and 4 depend either directly or indirectly from claim 1, these claims are also not taught or suggested for at least the same reasons set forth with respect to claim 1.

Amended claim 5 is directed to a fuel injector assembly comprising a plurality of components formed of solenoid-quality stabilized ferritic stainless steel. At least two of the plurality of components are adjacent and are joined together by welding. The stabilized ferritic stainless steel comprises, in terms of weight percentage, about 21% to about 35% chromium and at least one element selected from the group consisting of titanium and columbium. Each of the at least one element is present at no more than about 1.5 weight percent.

For at least the same reasons set forth with respect to claim 1, Applicant submits that the combination of the Kosa reference and the Luttrell reference do not teach or suggest a fuel injector assembly including a plurality of components formed of solenoid-quality stabilized ferritic stainless steel comprising, in terms of weight percentage, about 21% to about 35% chromium as recited in amended claim 5. As claims 6-9, 11-13 and 16 depend either directly or indirectly from claim 5, these claims are also not taught or suggested by the Kosa and Luttrell references for at least the same reason set forth with respect to claim 5.

Amended claim 18 is directed to a fuel injector assembly including an electric solenoid actuator, wherein the assembly comprises a fuel tube formed of an austenitic stainless steel and an injector body formed of a stabilized ferritic stainless steel. The fuel tube and the injector body are joined together by welding. The stabilized ferritic stainless steel comprises, in terms of weight percentage, about 21% to about 35% chromium and at least one element selected from the group consisting of titanium and columbium. Each of the at least one element is present at no more than about 1.5 weight percent.

For at least the same reasons set forth with respect to claim 1, Applicant submits that the combination of the Kosa reference and the Luttrell reference do not teach or suggest a fuel injector assembly including a fuel injector body formed of stabilized ferritic stainless steel comprising, in terms of weight percentage, about 21% to about 35% chromium as recited in amended claim 18. As claim 18 depends from claim 18, this claim is also not taught or suggested by the Kosa and Luttrell references for at least the same reason set forth with respect to claim 18.

Amended claim 24 is directed to a fuel injector assembly comprising a plurality of components, wherein at least one of the plurality of components is formed of solenoid-quality stabilized ferritic stainless steel. The stabilized ferritic stainless includes, in terms of weight percentage, about 10% to about 35% chromium and between 0.26 and 1.5 weight percent of titanium.

In rejecting claim 1, the Examiner noted that the Kosa reference discloses a stabilized ferritic stainless steel alloy comprising, in terms of weight percentage,

15-20% chromium, up to 0.51% titanium, and up to 0.34% columbium/niobium.

See *Final Office Action*, pg. 6. Applicant submits that the Kosa reference teaches away from using titanium in an amount up to 0.51% titanium as suggested by the Examiner. It appears the Examiner's support for saying that the Kosa reference discloses titanium up to about 0.51% from an Alloy G is set forth in Table 1. See *Kosa*, Col. 5, lines 37-57. While Alloy G listed in Table 1 in the Kosa reference is shown as including 0.51% titanium, the results of the Erichsen cup testing in Table 3 were noted as inconsistent for Alloy G, and the results of the salt spray testing shown in Table 5 showed large pitting for Alloy G indicating a "relatively more severe attack." See *Kosa*, Col. 5, lines 38-57; Col. 7, lines 2-44; Col. 9, lines 5-25; Col. 10, lines 3-5. Given the discussion of Alloy G in the Kosa reference, Applicant submits that using up to 0.51% titanium in the disclosed alloy is not taught or suggested by the Kosa reference. Instead, the Kosa reference states that not more than about 0.02% titanium is used in the alloy. See *Kosa*, Col. 4, lines 17-18. As such, Applicant submits that the Kosa reference discloses an alloy including up to 0.02% titanium, not between 0.26 and 1.5 weight percent of titanium as recited in claim 24. For at least this reason, Applicant requests that the rejection of claim 25 be withdrawn.

Amended claim 25 is directed to a fuel injector assembly comprising a plurality of components, wherein at least one of the plurality of components is formed of solenoid-quality stabilized ferritic stainless steel. The stabilized ferritic stainless includes, in terms of weight percentage, about 10% to about 35% chromium and between 1.1 and 1.5 weight percent of columbium.

As stated above, the Examiner noted that the Kosa reference discloses a stabilized ferritic stainless steel alloy comprising, in terms of weight percentage, up to 0.34% columbium/niobium. See *Final Office Action*, pg. 6. Since the alloy in the Kosa reference is only described as including up to 0.34% columbium/niobium, all of the limitations included in amended claim 25 have not been met. Specifically, nothing in the Kosa or Luttrell references teaches or suggests a solenoid-quality stabilized ferritic stainless steel including between 1.1 and 1.5 weight percent of columbium. For at least this reason, Applicant requests that the rejection of claim 24 be withdrawn.

The Examiner stated that claim 14 would be allowable if rewritten to overcome the rejections under 35 U.S.C. § 112 and to include all of the limitations of the base claim and any intervening claims. Therefore, claim 14 has been rewritten in independent form as claim 26 and includes the limitations of claims 5 and 12-14.

### Conclusion

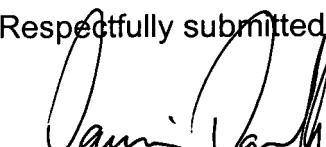
In light of the foregoing, Applicant submits that claims 1, 3-9, 11-14, 16, 18, 19 and 24-26 are in condition for allowance and such allowance is respectfully requested. Should the Examiner feel that any unresolved issues remain in this case, the undersigned may be contacted at the telephone number listed below to arrange for an issue resolving conference.

Applicant does not believe that any fee is due at this time. However, the Commissioner is hereby authorized to charge any fee that may have been

overlooked to Deposit Account No. 10-0223.

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Respectfully submitted,

  
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